

Appl. No. 10/758,692
Amdt. Dated September 14, 2005
Reply to Office Action of June 14, 2005

Attorney Docket No. 81870.0027
Customer No.: 26021

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently amended) An optical isolator element, comprising:
at least one flat Faraday rotator, and
at least two flat polarizers,
wherein the Faraday rotator and the polarizers are bonded to each other by van der Waals forces acting between bonding surfaces thereof,
with the bonding surfaces being brought into contact with each other while the bonding surfaces are activated such that atom bonds are present thereon.
2. (Currently amended) An optical isolator element according to claim 1, wherein the bonding surfaces surface of at least either one of the Faraday rotator and the polarizers ~~are~~ is integrally provided with ~~films~~ an anti-reflection multi-layer film made of an inorganic material .
3. (Currently amended) An optical isolator element according to claim 1, wherein the bonding surfaces of at least either one of the Faraday rotator and the polarizers are integrally provided with films made of a soft material which is softer than a dielectric hard material.

4-6. (Canceled)

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7. (Currently amended) An optical isolator comprising:
an optical isolator element according to claim 1, including at least one flat Faraday rotator and at least two flat polarizers bonded to each other by van der Waals forces acting between bonding surfaces thereof,
and a magnetic element arranged around the optical isolator element.

8. (Original) An optical isolator element according to claim 7, wherein the magnetic element is tubular and the optical isolator element is arranged inside the tubular magnetic element.

9-10. (Canceled)

11. (Currently amended) A method for producing an optical isolator element including at least one flat Faraday rotator and at least two flat polarizers bonded to each other via their bonding surfaces, comprising the steps of:

activating the bonding surfaces of the Faraday rotator and the polarizers such that atom bonds are present thereon, and

bringing the Faraday rotator and the polarizers having the activated bonding surfaces ~~activated~~ into contact with each other in vacuum at room temperature, thereby bonding the Faraday rotator and the polarizers by van der Waals forces created on the bonding surfaces of the Faraday rotator and the polarizers.

12. (Currently amended) A method according to claim 11, wherein a step of smoothing the bonding surfaces of the Faraday rotator and the polarizers by chemical mechanical polishing is performed before the step of activating the bonding surfaces of the Faraday rotator and the polarizers.

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13. (Currently amended) A method according to claim ~~12~~ 11, wherein the bonding surfaces are so smoothed that the surface coarsenesses thereof are 10 nm or below.

14. (Currently amended) A method according to claim 11, wherein a pushing force is exerted ~~in such a direction as to bond~~ press-contact the Faraday rotator and the polarizers with each other when the Faraday rotator and the polarizers having the bonding surfaces thereof ~~activated~~ are ~~brought into contact~~ bonded with each other in vacuum.

15. (Currently amended) A method according to claim 11, wherein a step of integrally forming films an anti-reflection multi-layer film made of an inorganic material on the bonding surfaces of at least either one of the Faraday rotator and the polarizers is performed before the step of activating the bonding surfaces of the Faraday rotator and the polarizers.

16. (Original) A method according to claim 11, wherein a step of integrally forming films made of a soft material on the bonding surfaces of at least either one of the Faraday rotator and the polarizers is performed before the step of activating the bonding surfaces of the Faraday rotator and the polarizers.

17. (Currently amended) A method for producing an optical isolator element including at least one flat Faraday rotator and at least two flat polarizers bonded to each other, comprising the steps of:

cleaning bonding surfaces of the Faraday rotator and the polarizers by chemical mechanical polishing.

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activating the bonding surfaces of at least either one of the Faraday rotator and the polarizers by the adsorption of hydroxyl groups, and

bringing the Faraday rotator and the polarizers into contact with each other in vacuum, thereby bonding the Faraday rotator and the polarizers by hydrogen-bonding forces acting between the hydroxyl groups on the bonding surfaces at one side and oxygen atoms in the other bonding surfaces.

18. (Original) A method according to claim 17, wherein a step of smoothing the bonding surfaces of the Faraday rotator and the polarizers is performed before the step of cleaning the bonding surfaces of the Faraday rotator and the polarizers.

19. (Original) A method according to claim 18, wherein the bonding surfaces are so smoothed that the surface coarsenesses thereof are 10 nm or below.

20. (Currently amended) A method according to claim 17, wherein a step of integrally forming ~~films~~ an anti-reflection multi-layer film made of an inorganic material on the bonding surfaces of at least either one of the Faraday rotator and the polarizers is performed before the step of cleaning the bonding surfaces of the Faraday rotator and the polarizers.

21. (Original) A method according to claim 17, wherein step of integrally forming films made of a soft material on the bonding surfaces of at least either one of the Faraday rotator and the polarizers is performed before the step of cleaning the bonding surfaces of the Faraday rotator and the polarizers.

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22. (New) A method according to claim 11, wherein the step of activating the bonding surfaces is performed by projecting ion beams or neutral atoms onto the bonding surfaces.